

Interest Rates, Unemployment and Inflation: The Canadian Experience in the 1990s

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INTRODUCTION

The Canadian economy did poorly in the 1990s, particularly in the first half of the decade. Table 1 considers decade averages for Canada since 1920. It shows that in the 1990s per capita real GDP never grew more slowly, and unemployment was never higher on average, since the decade of the 1930s. An offsetting factor was the marked deceleration in consumer prices. Inflation, according to the Consumer Price Index, was at its lowest level since the 1930s. Table 2 extends the comparison to the eight largest economies of the OECD over the 1990s. Canada had the lowest growth rate of all countries for per capita GDP. Its average unemployment rate (of nearly 10 percent) was not too far below those observed in France and Italy. Again, Canada's CPI inflation rate was on the low side, exceeding only those of France and Japan. This review will focus on the last two dimensions of Canada's economic performance in the 1990s — unemployment and inflation. The first dimension — the trend growth of per capita real GDP — is left for others to discuss.

The performance of the Canadian economy in the 1990s regarding unemployment looks particularly bad when compared to that of the United States. Chart 1 depicts the time path of the Canada-US unemployment rate *differential* (Canadian unemployment minus US unemployment). It rose sharply to 4.5 percentage points in 1993 from 2.2 points in 1989, reflecting the comparative depth and length of the Canadian recession. Then it began to shrink after the Canadian recovery finally took hold in 1997, but going into 2001 it was still 2.7 points — above the 1989 level. In contrast, as shown in Chart 2, the Canada-US CPI inflation differential was almost consistently *negative*, indicating that inflation was higher in the United States than in Canada every year except in 1991, when the goods and services tax was introduced in Canada. Over the nine-year period 1992-2000, the CPI inflation rate averaged 2.7 percent in the United States and 1.6 percent in Canada.

In this broad description of events, the key observation is the negative correlation between inflation and unemployment outcomes. The inflation rate was the lowest in

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TABLE 1
Growth, Unemployment and CPI Inflation in
Canada, Decade Averages 1920s-1990s

Decade	Growth rate of real per capita GDP (%/year)	Unemployment rate (%)	CPI inflation rate (%/year)
1920s	4.3 ¹	3.5 ²	-0.6
1930s	-0.6	13.1	-1.8
1940s	3.8	3.2	4.7
1950s	2.4	4.2	2.4
1960s	3.2	5.0	2.5
1970s	3.0	6.7	7.3
1980s	1.7	9.4	6.5
1990s	1.1	9.6	2.2

Note: The growth rate of real GDP per capita is the annual percentage change in the ratio of GDP in constant dollars to the total population; the unemployment rate is the average proportion of the labour force who are without work; the CPI inflation rate is the annual percentage change in the all-items CPI. The standard definition of decades is 1920-29 and so on. For growth and inflation, the calculated averages are compounded average rates of changes over the decade.

¹ Average for 1926-29.

² Average for 1921-29.

Source: Statistics Canada.

six decades, falling below the US rate. In contrast, the unemployment rate was the highest in six decades, exceeding the US rate by a significant margin. This naturally raises the following question: If there is a genuine negative trade-off between inflation and unemployment, were the policy choices made to influence the actual outcomes for inflation and unemployment in that trade-off the best in the circumstances?

In the following sections, I argue that Canadian interest and unemployment rates were too high and that inflation was too low. I attribute a large share of responsibility for these outcomes to excessively restrictive monetary policy. I suggest various ways in which Canadian monetary policy could be welfare-improving in the future.

THE MONETARY TRANSMISSION MECHANISM

In assessing the role played by monetary policy in the events of the 1990s, it is useful to first clarify the framework for discussion. I will rely on the usual three-step “transmission mechanism” of monetary policy (see Thiessen 1995). Consider the case of the Bank of Canada tightening monetary conditions. The first step is for the Bank to withdraw cash from the financial system. With less cash in circulation, the cost of borrowing and short-term interest rates increase. An immediate consequence is that more foreign capital is attracted to Canadian-dollar assets and that the exchange rate of the Canadian dollar appreciates. These simultaneous increases in interest rates and in the value of the Canadian dollar are exactly what is meant

TABLE 2
Growth, Unemployment and CPI Inflation in
the Eight Largest OECD Countries, 1990s
Averages

Country	Growth rate of real per capita GDP (%/year)	Unemployment rate (%)	CPI inflation rate (%/year)
United States	2.0	5.8	3.0
Japan	1.4	3.1	1.2
Germany	1.6	7.5	2.5
France	1.2	11.3	1.9
Italy	1.4	10.6	4.2
United Kingdom	1.6	8.2	3.7
Canada	1.1	9.6	2.2
Spain	2.3	19.9	4.2

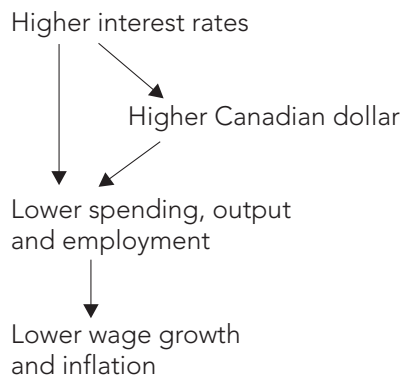
Note: See definitions in the note to Table 1. Unemployment rates are based on the standardized definitions used by the OECD.

Source: OECD.

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by a “tightening of monetary conditions.” The second step in the transmission mechanism is that higher interest rates and the appreciated Canadian dollar both depress aggregate spending and output. Higher interest rates discourage consumption and investment, and the appreciated dollar slows down exports and stimulates imports. Lower sales and profits then induce firms to reduce output and employment. The third step is that weaker profits and higher unemployment induce firms and workers to be more prudent in setting wages and prices. Wage growth and price inflation both decline. Two important characteristics of this mechanism are that it takes up to two years to unfold and that it operates in an uncertain economic environment.

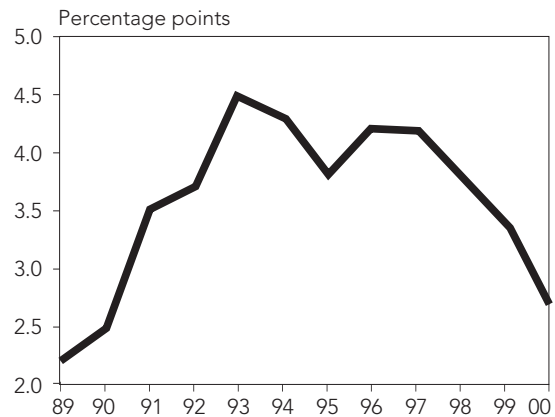
The following arrow diagram summarizes the transmission mechanism:



Within this framework, the mandate of Canadian monetary policy since the beginning of the 1990s has been to achieve a specified inflation target at least cost in terms of lost output and employment. Setting an inflation target within a specified range is, in my view, a reasonable way of conducting monetary policy in a country operating under a regime of flexible exchange rate. It helps to stabilize inflation

CHART 1

The Canada-US Unemployment Rate Differential: Canadian Unemployment Minus US Unemployment, 1989-2000



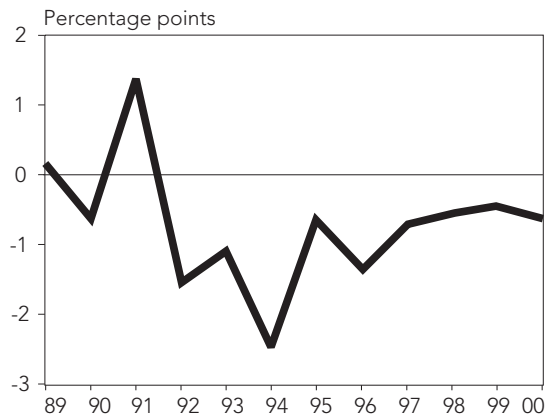
Source: Statistics Canada; US Bureau of Labor Statistics.

expectations and gives a clear signal to public and private sector agents as to what monetary policy is up to and how it is going to react under various circumstances, thus reducing uncertainty. Since 1995 in Canada, the official inflation target has been 2 percent, which is the midpoint of the official target range of 1 to 3 percent.

The arrow diagram clarifies the nature of the policy conflict between the objectives of low unemployment and low inflation. Increasing interest rates and the value of the dollar raises unemployment and reduces inflation; decreasing interest rates and the value of the dollar reduces unemployment and raises inflation. There is a trade-off, and a policy choice cannot be avoided. I will accordingly consider three broad questions concerning the conduct of monetary policy in the 1990s. First, have interest rates been too high? Second, have output and employment been too low? Third, has the inflation rate been too low? My answers to these questions will be: yes, yes and yes.

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CHART 2
The Canada-US CPI Inflation Rate
Differential: Canadian Inflation Minus
US Inflation, 1989-2000



Source: Statistics Canada; US Bureau of Labor Statistics.

HIGH INTEREST RATES

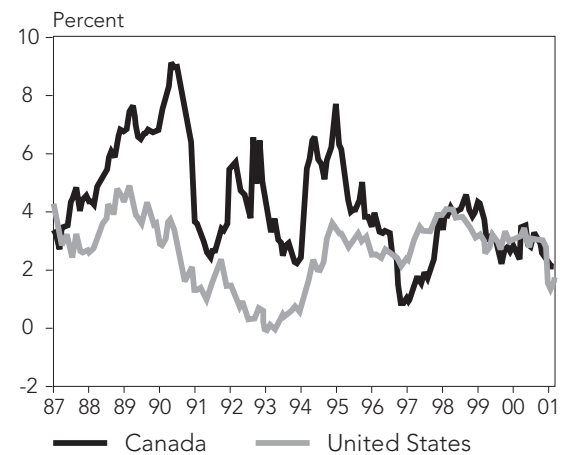
Chart 3 shows the evolution of Canadian and US *real* (i.e., net of CPI inflation) short-term interest rates since 1987. In the seven-year period 1989-95, the Canadian rate exceeded the US rate by an unprecedented margin of 3.12 percentage points on average. Does this mean Canadian interest rates were too high and Canadian monetary policy too tight in this period?

Before answering this question, it is important to hear the account of Canadian economic events of the decade given by the Bank of Canada. A recent article by Deputy Governor Freedman gives exactly such an account (Freedman, in press). Recognizing that Canada's economic performance in the 1990s, especially in the first half of the decade, was "not entirely satisfactory," Freedman begins by stating: "The tightening of monetary conditions in the latter part of the 1980s and the introduction of inflation targets in 1991 were aimed at fore-

stalling...an outbreak of inflation and getting the rate of inflation down to lower levels than had prevailed in the 1980s." He admits that the Bank of Canada and other forecasters were then taken by surprise by the swift reaction of the economy: "Although the consensus forecast at the time was for a soft landing of the economy, the downturn in 1990-91 was much deeper than had been anticipated, the rate of inflation came down much faster than planned, and the recovery was slower than expected."

Freedman attributes the first two occurrences to the US recession and a sharp decline in commodity prices. He then explains the third development — the extended weakness of the economy past 1991 — by three factors. First, the severe fiscal problems experienced by all levels of government initially "resulted in higher interest rates on Canadian debt, as risk premiums were built into medium- and longer-term interest rates." Later, the tax increases and expenditure reductions needed

CHART 3
Real 3-month Interest Rate on Corporate
Paper, Canada and United States, January
1987-March 2001



Source: Bank of Canada and Statistics Canada; US Federal Reserve Board and US Bureau of Labor Statistics.

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to bring the fiscal situation back under control had the unavoidable side effect of prolonging the sluggishness of domestic spending and output. Second, Freedman argues, globalization, free trade, deregulation and technological change generated significant private sector restructuring, which increased the negative effects on aggregate spending, output and employment.

Third, he suggests that although the Bank of Canada came to realize aggregate activity was declining further and wanted to provide more support to the ailing economy, its "attempts to reduce short-term interest rates were hindered." He explains: "On a number of occasions...nervousness in the markets about the combination of the fiscal situation in Canada, domestic political developments, and international financial developments resulted in higher interest rates and tighter monetary conditions than the Bank desired... In such circumstances...efforts by the Bank to aggressively lower very short-term interest rates would have risked undermining confidence in Canadian-dollar-denominated assets and causing interest rates further out the yield curve to increase — a counter-productive outcome." Freedman sees confirmation of the key importance of fiscal credibility in the fact that "it was only in the second half of the 1990s, when the deficit was brought under control and the debt-to-GDP ratio was seen to be moving onto a credible downward track, that the risk premiums fell and Canadian interest rates were able to move below US rates."

I am sceptical about two specific arguments made by Freedman. First, I find it hard to believe that private sector restructuring was a cause of sluggishness of the recovery. The Deputy Governor seems to confuse a real-

location shock affecting the *composition* of demand with an aggregate demand shock impacting on its *level*. Further, not to deny the supply-side possibility that a major reallocation shock could raise aggregate unemployment by increasing the degree of mismatch in labour markets, the available evidence in this particular instance is just the opposite. From 1992 to 1996, the national unemployment rate declined by about 1.5 percentage points at a given level of the aggregate job offer rate. This indicated the degree of job mismatch and structural unemployment were both declining, not rising.

Second, I am not convinced by the argument that market concerns about the fiscal situation and other developments prevented the Bank of Canada from easing monetary conditions. Monetary conditions broadly mean the whole range of interest rates and asset prices, including the exchange rate, and bank liquidity. Even in instances where markets interest rates would steadfastly refuse to decline despite large injections of central bank cash, monetary conditions would still be improved by relaxing the constraints on bank credit and allowing the exchange rate to depreciate to some (limited) extent. Aggregate demand would increase as a result.

Be that as it may, Freedman's bottom line is that fiscal policy is to blame and that monetary policy was never in error. However, an entirely different interpretation of Canadian events in the 1989-95 period is possible. It is arguable that the explosion of debt-service costs, the deep and protracted recession, the drop in fiscal revenue, the rise in social expenditures, rising risk premiums, unsettled financial markets, the constraints on the central bank's ability to ease monetary

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conditions, and the sharp fiscal retrenchment were all initiated by the high interest rates the Bank of Canada had begun to set as early as in 1988. It can also be argued that, in contrast, fiscal policy had been on the right course. The structural fiscal balance had been improving every year after 1985, and as of 1989 the debt-to-GDP ratio had been stabilized. The comparison with US events is quite revealing. Entering the 1990s with approximately the same public sector debt-to-GDP ratio as Canada at the end of the 1980s, the US Federal Reserve kept real short-term interest rates more than 3 points below Canadian rates on average over the 1989-95 period (Chart 3). In this way, the United States avoided the kind of monetary overkill that hit Canada and was able to escape a full-blown economic and fiscal crisis. The bottom line of this alternative story is that monetary policy, not fiscal policy, is to blame for Canada's dismal economic performance in the first half of the 1990s.

Which of the two stories makes more sense? I am inclined to believe that monetary policy was the first mover. It initiated the unfortunate sequence of events by raising interest rates sharply in the late 1980s. The economic and fiscal crisis came later. But I am nevertheless ready to concede that fiscal policy had previously made the public sector financially vulnerable and must share responsibility for what happened. Even if the public sector debt-to-GDP ratio had been stabilized at the end of the 1980s, it was still too high. The Canadian public sector was exposed to a new round of rising debt and deficits in the event that interest rates would rise significantly. It should have been obvious to anyone that close coordination between fiscal and monetary policy was

essential at the point (1988) when the Bank of Canada began to raise interest rates to contain and reduce inflation. Fiscal-monetary coordination would have meant more moderate increases in interest rates by the Bank of Canada, and a strong fiscal commitment to reduce the debt-to-GDP ratio more quickly. Without coordination, interest rates, the budget and the entire economy went out of control for seven years. Here again, the contrast with US events is striking. Recent accounts of the interaction between Greenspan's Federal Reserve and the Bush and Clinton administrations from 1987 to 2000 all emphasize that monetary-fiscal coordination was a key ingredient of US macroeconomic success in the last decade (Martin 2000; Woodward 2000).

Why was fiscal-monetary coordination absent from Canadian policy planning until 1995? It is hard to say. Clearly, the late 1980s were extremely busy years for the Mulroney government. It had to simultaneously handle several delicate reforms involving deregulation, privatization, major tax changes, free trade and so on. Maybe it thought monetary policy was one ball too many to juggle and was only too happy to give the Bank of Canada *carte blanche* with interest rates. And maybe in turn the Bank of Canada failed to make as forcefully clear to the government as it should have the dire financial consequences of higher interest rates interacting with the large accumulated debt. Whatever the reason, policy coordination does not seem to have been part of the vocabulary of the time.

To summarize, the fact that Canadian interest rates were too high for too long is universally acknowledged, including by the Bank of Canada. But there are differences in

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the interpretation of events. The Bank argues that interest rates stayed high mainly because the fiscal situation had deteriorated so much that markets began to require risk premiums to hold Canadian-dollar assets. Others point out that the fiscal situation would not have reached that point if the Bank of Canada had not raised interest rates so sharply in the first place. Obviously, the problem stemmed from the damaging interaction between high accumulated public debt and high interest rates, and the solution resided in a monetary-fiscal pact to reduce the debt and keep interest rates low. Policy coordination could have avoided the problem, but unfortunately did not take place. To witness, by establishing a better mix between the two policy levers — tighter budgets and easier money — at an early stage, the United States experienced a shallower and shorter recession followed by a swift recovery.

HIGH UNEMPLOYMENT

Lack of policy coordination was one type of policy error made in the first half of the 1990s. But serious difficulties also marked the management of aggregate demand by the Bank of Canada throughout the decade. As indicated earlier in the description of the monetary transmission mechanism, interest rates and the exchange rate exert a lasting influence on inflation through their impact on aggregate spending, output and employment. More specifically, the central bank normally tries to set monetary conditions so as to influence the gap between actual output and a threshold level of output called *potential output*. Potential output is defined as the maximum level of out-

put that can be sustained without inducing a general price acceleration. The further actual output is below potential output — that is, the larger the *output gap* the stronger the downward pressure on inflation. In real time, output gap management is an important component of central bank operations because it constitutes the key intermediate link between the immediate monetary instrument — interest rates — and the ultimate target of policy — the inflation rate. It takes about a year for the output gap to react to the initial monetary impulse, and another year for the inflation rate to respond to the induced change in the output gap.

The process of targeting a certain level of the output gap (with an eye to controlling inflation) can be subject to three types of error. First, potential output is an unknown quantity that must be estimated. It can be overestimated or underestimated. Second, the level of output targeted by the central bank can be too high or too low relative to the estimated potential output. Third, actual output may eventually turn out to exceed or fall short of targeted output. I see evidence of a systematic tendency on the part of the Bank of Canada to err on the low side in all three components of its operations. Most of the time, actual output fell short of targeted output, targeted output was kept below the estimated potential and potential output itself was underestimated.

During the 1990s the first tendency was for actual output to fall short of targeted output. This came as a surprise to the Bank of Canada. As Bank of Canada researchers Freedman and Macklem (1998) put it: “From 1989 to 1991, both real interest rates and the real value of the Canadian dollar were high, but between 1991 and

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1995 the Canadian dollar depreciated by more than 25 per cent. Based on historical estimates of the effects of monetary conditions on aggregate demand, the puzzle is why we did not see a stronger recovery, given the easing in monetary conditions over the period." In other words, even if interest rates remained high, the exchange rate depreciation was so large that the Bank thought monetary conditions were easy and monetary policy expansionary on net.

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As we have seen, Freedman (in press) explains this implementation error after the fact by the fiscal situation, by the risk premiums it introduced into the interest rate structure and by private sector restructuring. But this explanation is hard to accept, since the central bank could observe fiscal policy and the high levels of medium- to longer-term interest rates and take their aggregate demand consequences into account in setting short-term interest rates. Further, there is no evidence of negative effects of restructuring on aggregate *demand*. A more plausible explanation is that the Bank of Canada seriously underestimated the negative effects of high interest rates on consumption and investment, and overestimated the favourable effects of the exchange rate depreciation on net exports. This interpretation is given credence by Freedman and Macklem's admission that a key output equation (Duguay 1994) previously used by the Bank to measure the response of output to the short-term interest rate and the exchange rate and to construct the Bank's monetary conditions index turned out to overestimate output cumulatively by 12 percent over the 1992-96 period.

The second tendency has been for targeted output to be held below the estimated level of potential output. Once inflation had

been reduced to a low level in 1992, it was decided to keep it there. After inflation expectations had adjusted, the deterministic solution would have called for bringing actual output to match potential, thus leaving neither upward nor downward pressure on the inflation rate. This would have meant planning for a zero output gap.

An important practical problem, however, is that potential output is unobserved and has to be estimated by the central bank. In this uncertain environment, it is not usually optimal to plan for actual output to match the estimated level of potential output as if the latter were certain. In general, the optimal solution of this planning problem under uncertainty is to aim for an actual output level that makes the subjective probability of exceeding the true potential output a decreasing function of the perceived cost of doing so. In other words, if you think exceeding the true potential output level is very expensive because you figure the recession cost of eliminating the resulting increase in inflation is large, then you will make sure the probability of making that mistake is very small. For a sufficiently large estimated cost, you will aim for an actual output level *below* your subjective expected value for potential output.

Is there evidence that, during the 1990s, the Bank of Canada was seriously concerned about the prospect of actual output exceeding potential output? Yes. While, understandably, there was no official statement to that effect, the Bank of Canada Research Department put out many papers suggesting that inflation responded significantly more to the output gap when actual output was above potential than when it was below it (e.g., Fillion and Léonard 1997; Laxton et al. 1993a; Macklem 1997). Laxton

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et al. (1993b) made the policy implications explicit, and further argued that “if a central bank cannot be sure of whether the economy is non-linear or linear, it is better off maintaining the a priori position that the economy is non-linear.”

This continued insistence on non-linear inflation dynamics makes it almost a sure bet that the Bank of Canada aimed for positive output gaps in order to buy insurance against unknowingly crossing over the potential output line. It should be noted that no such fear of non-linearity was held at the US Federal Reserve or at the US Council of Economic Advisers (e.g., Blinder 1998; Stiglitz 1997).

The third tendency has been for true potential output to be underestimated. The Bank of Canada has in fact recently admitted that its methods had previously led it to underestimate true potential output (Bank of Canada 1999). It attributes this systematic bias to the greater-than-expected economic restructuring that took place in Canada in the 1990s and encouraged faster productivity growth.

But to construct its estimate of potential output the Bank also relied on questionable smoothing techniques and neglected widespread evidence of declining structural unemployment. In essence, the Bank applied mechanical trend-fitting techniques (called “filters”) to the past history of actual output, and then weighted the results of this operation judgements with certain estimated statistical relationships (Butler 1996). Unfortunately, this methodology seems liable to automatically build sustained slumps into the estimated trend of potential output (Krugman 1998). One result was that, over the seven-year period 1990-96, the Bank’s estimate of the average growth rate of poten-

tial GDP per capita for Canada was only 0.4 percent per year. This does not make sense under any reasonable set of assumptions about trend productivity growth and employment rate change.

In addition, the Bank was slow to recognize the tendency, which was already discernible by mid-decade, for the national unemployment rate to decline at any given level of the job offer rate (see Fortin 1999). Consistent with this shift, the relative size of the youth labour force was declining, the average level of education was rising rapidly, deregulation and globalization were increasing competitive pressure in labour and product markets, and stiffer regulations were imposed on access to unemployment insurance benefits. All of these factors are known to reduce the minimum non-inflationary unemployment rate, and hence to increase potential output.

The three types of error just reviewed — actual output below targeted output, targeted output below estimated potential output and estimated potential output below true potential output — have all contributed to holding actual output below true potential output. This has imparted a deflationary bias to Canadian monetary policy not only in the first half of the decade but in the second half as well. Consequently, the inflation rate was too low.

LOW INFLATION

In 1988 the Bank of Canada announced it would pursue the medium-term objective of “price stability,” which essentially meant reducing CPI inflation below 2 percent (Bank of Canada 1988). In early 1991 the

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Governor of the Bank and the Minister of Finance jointly announced the setting of targets for reducing CPI inflation and reaching price stability in Canada. The official inflation target was set at 3 percent by the end of 1992, 2.5 percent by the middle of 1994 and 2 percent by the end of 1995 (Bank of Canada 1991). The agreement between the Governor and the Minister was renewed in 1993 and 1998, extending the 2 percent target from the end of 1995 to the end of 2001 (Bank of Canada 1993/94, 1998). The agreement has provided for a target range of plus or minus one percentage point around the official target. Thus since 1995 the official inflation target has been 2 percent and the target range has been 1 to 3 percent. The target is defined in terms of the 12-month rate of increase in the total CPI, but the operational guide for policy has been the increase in the CPI excluding food, energy and the effect of indirect taxes, called the *core* inflation rate.

The inflation rate was too low in Canada through the 1990s, for two reasons. First, the actual inflation rate was kept systematically below the official target. Second, as I will argue, the official target itself was set at too low a level.

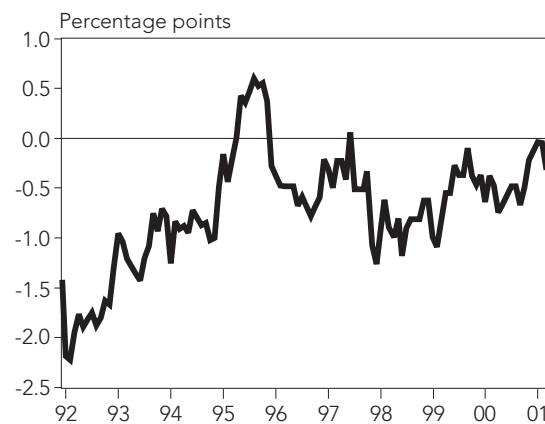
Actual Inflation Below Target

Chart 4 establishes that from December 1991 to March 2001 actual inflation never exceeded the inflation target except for eight months in 1995 and one month in 1997. In that nine-year period, core inflation was 0.70 point below target on average. Even in the more recent 1996-2000 period, after the fiscal situation could no longer be used as an excuse, the gap between actual and target inflation still averaged 0.55 points.

There are three possible explanations for this systematic undershooting of target. The first is that the Bank of Canada was honestly aiming at target throughout the 1990s but was frustrated by an incredible string of bad luck, with unexpected factors constantly pushing actual inflation below target. However, once the variability of the inflation process is taken into account, formal statistical tests show that the probability bad luck would strike five years in a row from 1996 to 2000 is less than 1/1000. Pure randomness must be rejected.

The second possible explanation is that the Bank of Canada always wanted to achieve the inflation target but kept undershooting it for various reasons. At times, it may have felt the fiscal situation and other uncertainties were hindering its efforts to reduce interest rates. It may also have kept actual output too far below its true non-inflationary potential for all the reasons enumerated in the previous section: misjudgement of interest rate and exchange rate multipliers, excessive fear

CHART 4
Difference Between Actual Inflation and Target Inflation, Canada, December 1991-March 2001



Source: Bank of Canada and Statistics Canada.

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of exceeding estimated potential output and underestimation of true potential output.

The final possibility is that, even though the 1991 joint communiqué specified “it is the midpoints of the range that will be the objective of monetary policy actions...rather than the upper or lower band” (Bank of Canada 1991), the Bank may nevertheless have decided it would keep actual inflation below the official target. The reason it would have consciously undershot the official inflation target is to position itself strategically to convince the government the target should be reduced further below 2 percent. That would have been in conformity with the statement of the 1991 communiqué that price stability was “a rate of increase in the CPI that is clearly below 2 per cent.” Former Governor Crow seemed to support this strategic approach in 1997 when he declared that there was “no good economic reason to drive inflation up from current levels after having got it down and kept it down — whether that was by intention or by good fortune.” Hence, “with inflation already having been held at around 1.5 percent for a number of years, 0.5 to 2.5 percent could easily be announced as a target range that constitutes a working definition of price stability” (Crow 1997). However, in 1998 the government was not ready to lower the official target below 2 percent.

Why should it matter that actual inflation averaged a mere 0.5 point less than the official target rate over an extended period? Essentially because, when inflation is already very low, even a slight further reduction in inflation could have important damaging impacts on the levels of output and employment that could be sustained permanently. I will in fact argue not only that the 1.5 per-

cent average inflation rate achieved over the past decade was too low, but that the 2 percent official target was itself too low. The unemployment-minimizing rate of inflation would likely be in the 2.5 to 3 percent range and could support an unemployment rate as low as 5.3 percent in Canada.

Target Inflation Set Too Low

The traditional view of the trade-off between inflation and unemployment — the third component of the monetary transmission mechanism described earlier — is that the benefits from very low inflation are “large and permanent” and the related unemployment costs are “small and temporary.” While lower inflation has to be purchased at the cost of higher unemployment, this negative trade-off would be purely transitory. Many central bankers share this view. The macroeconomic expression of this idea is the following equation:

$$\text{annual change in inflation} = \\ \frac{1}{2} \times (\text{NAIRU} - \text{actual} \\ \text{unemployment})$$

This equation says inflation will increase, remain unchanged or decrease depending on whether the actual unemployment rate is less than, equal to or greater than some threshold unemployment rate, called the non-accelerating-inflation rate of unemployment (NAIRU). The NAIRU is exactly what I called the minimum non-inflationary unemployment rate in the previous section. It is the outcome of economic forces independent from monetary policy. We can call the difference between the NAIRU and actual unemployment the *unemployment gap*. The unemployment gap in labour markets is the analogue of the output gap in product markets defined earlier. In fact, the

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two gaps are roughly proportional — a relation called Okun's Law. As indicated in the equation, the standard estimate for the proportionality factor between the annual change in inflation and the unemployment gap is about one-half.

In this framework, a central bank can reduce inflation simply by temporarily raising actual unemployment above the NAIRU. It does so by first tightening monetary conditions to open an unemployment gap, then allowing inflation to decline, and finally easing monetary conditions to close the unemployment gap again once the job of reducing inflation is done. In the long run, there is a unique rate of unemployment that is consistent with an unchanging level of inflation (whatever that level turns out to be), namely the NAIRU itself. This can be represented by a vertical straight line in the unemployment-inflation plane.

The problem with this traditional view of the inflation process is that it is a total failure as a description of the time paths of inflation and unemployment in Canada over the past decade. To see this, one need only set out a reasonable path for the NAIRU over 1992-2000 and calculate how much cumulative deflationary pressure the path of actual unemployment would have generated as a result. I will assume, conservatively, that the Canadian NAIRU declined by 15 basis points a year, from 8.2 percent in 1989 (the Bank of Canada estimate for that year) to 6.6 percent in 2000 (which is slightly less than the actual unemployment rate of 6.8 percent for that year). Evidence of this kind of structural decrease in the NAIRU during the past decade was mentioned in the previous section. This assumption about the trend in the NAIRU implies that the sum of annual

unemployment gaps (the annual differences between actual unemployment and the NAIRU) cumulated to 19.4 percentage points over the nine years from 1992 to 2000. Given the proportionality factor of one-half, core inflation should have declined by 9.7 points from 1992 to 2000. But in fact the annual level of core inflation for 2000 (1.5 percent) was actually unchanged from its 1992 level.

This is a severe case of "missing deflation." In my view, it delivers a death blow to the traditional view of the inflation-unemployment trade-off contained in the equation above. It cannot be countered that the extra deflationary pressure created by the substantial gap between observed unemployment and the NAIRU was needed to deal with some large inflationary supply-side shocks. There were no such lasting shocks: On the wage front, union militancy was weak and wage moderation the rule. On the price scene, inflation rates from imports, food, energy and indirect tax changes were roughly in line with core inflation cumulatively. Measures of expected inflation were also roughly in line with past-year inflation. From 1992 up to the 2000 oil shock, on average about 85 percent of respondents to the semi-annual Conference Board Survey expected prices to increase by 2 percent or less.

If the "traditional" view of the inflation-unemployment trade-off is contradicted by evidence from the 1990s, what should it be replaced with? An even older view. It is striking to observe that, in the previous period of low inflation during the 1950s and 1960s, it was widely accepted that nominal wage and price rigidities mattered a great deal and that very low inflation was harmful to growth. To generate a "new" view of the

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inflation-unemployment trade-off more appropriate for a low-inflation economy, it is therefore worth revisiting ideas put forward in those days. I focus on views developed by James Tobin (1972) and by Otto Eckstein and Roger Brinner (1972).

Central to Tobin's analysis of the low-inflation environment is the effect of *downward nominal wage rigidity* in an economy in which individual firms keep experiencing unforeseen changes in the demand for their output. As the central bank seeks to achieve lower and lower inflation, the percentage of firms and workers facing *and* resisting the prospect of a nominal wage cut at any point in time increases. Firms are also reluctant to impose absolute wage cuts for fear of losing their best employees and suffering a drop in productivity. This general resistance to lower wages means that the authorities can achieve lower inflation only by imposing a *permanently* stronger dose of unemployment on the rest of the economy. The implications of Tobin's analysis are the following: In the range of moderate to high inflation rates, where few nominal wage constraints would have to be faced, the long-run trade-off between inflation and unemployment could be vertical at a unique NAIRU level in the unemployment-inflation plane, just as the traditional view predicts. But in the range of low inflation rates, where nominal wage constraints would become more and more common, the trade-off would be negatively sloped, convex and eventually flat at very low inflation rates (see Akerlof et al. 1996). Maintaining price stability or very low inflation in the presence of even a small amount of downward nominal wage rigidity (for instance, when only 10 to 20 percent of wage changes are constrained) could then

generate significant permanent losses in employment and output.

Eckstein and Brinner questioned the traditional view from a different perspective. They speculated that low inflation rates were *partially ignored* by wage- and price-setters. Reviewing US experience from 1955 to 1970, they suggested that, as inflation rose from less than 2 percent to greater than 5 percent, workers showed "increased awareness and concern" with the real purchasing power of their wages, so that past inflation became incorporated more fully into nominal wage contracts. Building on this intuition, Akerlof et al. (2000) offer several reasons and evidence for the tendency of wage- and price-setters to ignore inflation when it increases from zero to a small value. Basically, they argue that the cost to wage- and price-setters of ignoring inflation in this context is negligible, which makes this kind of behaviour "near-rational."

The key implication of near-rational ignorance of inflation is that nominal wages will be set higher in absolute terms, but lower relative to prices, when inflation is positive than when inflation is zero. As a result, operating the economy at a low positive rate of inflation will *increase* the permanent level output and employment. There will be a small one-time decline in the average ratio of wages to prices, which will make it more profitable for firms to hire more workers and produce more output. Formerly disenfranchised workers will be able to join the mainstream labour market. Naturally, when inflation increases, as occurred in the 1970s, the cost of being less than perfectly rational will rise, and people will switch their behaviour to take inflation fully into account. Their behaviour becomes "traditional." As

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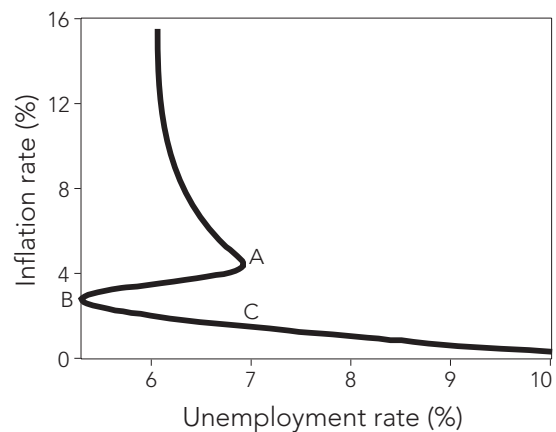
more and more wage-setters adopt fully rational behaviour, the initial output and employment gains begin to evaporate. This means that further increases in permanent inflation will *reduce* permanent output and employment. The important implication of this story, however, is that there is an unemployment-minimizing inflation rate, precisely where permanent output and employment cease to increase and begin to decrease.

Chart 5 shows what happens to the long-run trade-off between inflation and unemployment when Tobin's view on the effect of downward nominal wage rigidities and Eckstein and Brinner's intuition that inflation is partially ignored when it is low are blended together. This picture is drawn from preliminary results obtained by Fortin and Dumont (2000) for Canada, but it is entirely consistent with similar results obtained by Akerlof et al. (2000) for the United States. For inflation rates above 6.5 percent, there is a unique NAIRU as in the traditional case. Its estimated value, 6.1 percent, is the level of unemployment that can be sustained with unchanging inflation in the long run. As permanent inflation falls below 6.5 percent, however, the Tobin wage-floor effect begins to be felt. The trade-off becomes negatively sloped and convex. At around 4.5 percent inflation, the rate experienced in the 1980s, sustainable unemployment reaches a local maximum of 7 percent (point A). Then the Eckstein-Brinner partial-neglect effect sets in and reverses the slope of the curve until unemployment finds its lowest sustainable level at 5.3 percent with an inflation rate of 2.8 percent (point B). As inflation is further reduced, the wage-floor and partial-neglect effects combine to raise unemployment very

rapidly: the next 2-point decline in inflation — to 0.8 from 2.8 percent — adds 3.3 points to the unemployment rate.

On this estimated long-run Canadian trade-off, point B, with inflation at 2.8 percent and unemployment at 5.3 percent, is just about the social optimum. Going above point B to higher unemployment and higher inflation on the positively sloped segment of the long-run trade-off is clearly socially inferior. Nor is going below point B on the negatively sloped segment of the curve attractive. The social loss from higher permanent unemployment increases so rapidly that only those who hold extreme views about the cost of inflation would want to move the economy significantly below point B. If, as has been the case in Canada since 1992, the Bank of Canada holds inflation at 1.5 percent (at point C) instead of allowing it to increase into the 2.5 to 3 percent range, the national unemployment rate remains at the 7 percent level and is prevented from declining to 5.3 percent.

CHART 5
Long-run Inflation-unemployment Trade-off with Nominal Wage and Price Rigidities in the Low-inflation Range, Estimated with Canadian Data for 1956-1997



Source: Fortin and Dumont (2000).

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This underlines the point that when inflation is very low a *small* increase in inflation can have a *major* beneficial effect on output and employment. Under standard assumptions, the decrease of 1.7 points in unemployment that is predicted to occur when one moves up from point C to point B would generate 340,000 permanent new jobs and a permanent, sustained increase in annual national income of \$35 billion. Further evidence supporting the existence and importance of downward nominal wage rigidity in modern economies has recently been obtained from very large microdata sets by Lebow, Saks and Wilson (2000) for the United States and by Beissinger and Knoppik (2000) for Germany. Empirical support for the partial-neglect hypothesis also derives from the vast literature on the inflation-unemployment trade-off from the 1950s and 1960s, and from numerous ethnographic, psychological and industrial relations studies.

The estimates just reported and depicted in Chart 5 suggest that in Canada nominal wage and price rigidities tend to generate a very flat permanent trade-off between inflation and unemployment, in the range of zero to 2.5 percent inflation rates, and to increase unemployment permanently if inflation is allowed to significantly exceed 3 percent. Taking into account the usual statistical uncertainty, the prudent conclusion is that a welfare-maximizing monetary policy should search for the unemployment-minimizing inflation rate in the middle range of 2 to 4 percent, and not below 2 percent nor above 4 percent.

I conclude that the 1.5 percent inflation rate achieved by the Bank of Canada over the past nine years is much too low. The Bank has undershot the official target systematically, and it has set the official target

at too low a level. As a result, Canada has experienced a great deal of needless and costly excess unemployment.

There are some who take the 1.5 percent inflation rate and 7 percent unemployment rate recently achieved by Canada as a very satisfactory performance. Often heard are confident statements such as: "Canada's experience in the last few years and that of the United States...in the second half of the 1990s show that low inflation and strong demand can coexist comfortably" (Freedman, in press). The assertion that Canada's recent economic performance is comparable to that of the United States is surprising. As Charts 1 and 2 show, in recent years unemployment has been *much lower* in the United States than in Canada, while CPI inflation has been *higher* in the United States than in Canada, exactly as predicted by the empirical trade-offs I have just reported. Canadian authorities should be loath to assume there are no opportunities for lower unemployment simply because the unemployment rate is currently the lowest in the last quarter century. At present, global economic performance must be judged against the low average unemployment rate of the low-inflation decades of the 1950s and 1960s, not against the high average unemployment rate of the higher-inflation decades of the 1970s and 1980s. By that standard, the United States has been very successful in the last few years, Canada much less so. In terms of Chart 5, the United States is close to point B and Canada is still close to point C.

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SUMMARY AND CONCLUSION

The Canadian economy did poorly in the 1990s largely because interest rates and

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unemployment were too high and inflation was too low. In the late 1980s the Bank of Canada launched its drive toward price stability by raising interest rates sharply. Interacting with the large accumulated public debt, high interest rates eventually generated a full-blown economic and fiscal crisis that lasted until a recovery finally began in 1996. A fiscal-monetary agreement to reduce the debt-to-GDP ratio faster and keep interest rates low — as occurred in the United States — could have avoided the crisis, but unfortunately the two macropolicy levers remained uncoordinated for an extended period. Instead, we had a central bank that looked as if it wanted to teach the fiscal authorities a lesson, and a government that initially appeared unconcerned by the high level of the debt. We have learned from this sad episode in Canadian economic history that inflation targeting does not relieve the central bank and the government from the duty of agreeing on the best policy mix for economic stability and growth. In my view, this presently means a continuation of low interest rates and fiscal surpluses.

During the 1990s, serious difficulties also marked the management of aggregate demand by the Bank of Canada. First, actual output kept falling below potential output because the impacts of interest rate and exchange rate changes on aggregate spending and output were misjudged. Second, due to its excessive fear of actual output exceeding potential, the Bank of Canada tried to keep actual output below its estimated level of potential output. By erring on the conservative side, it was buying insurance against the return of inflation. Third, true potential output was also underestimated because the Bank used an

inferior methodology and missed the early downward trend in structural unemployment. All these problems of monetary management imparted a serious deflationary bias to Canadian monetary policy throughout the 1990s. Fortunately, there are indications that some of the problems have been recognized and that solutions are being implemented by the Bank of Canada. For example, the Bank now seems more careful in estimating the reaction of net exports to changes in the exchange rate. Its fear of an early return of inflation also seems less excessive than it was five years ago. And its methodology for estimating potential output now looks at many more indicators than in the past.

A major cause of persistent high unemployment in the 1990s was the very low inflation rate achieved by central bank policy — 1.5 percent on average since 1992. First, in contradiction to the prescription of the 1991 agreement between the Governor of the Bank of Canada and the Minister of Finance, inflation was kept *below* the official target most of the time. Second, recent research based on German, US and Canadian data has raised the possibility that the official target itself (2 percent since 1995) could be *less* than the unemployment-minimizing inflation rate. The bottom line of that research is that, if the inflation target was increased into the 2.5 to 3 percent range from the current 2 percent level, Canada could sustain an unemployment rate of 5.5 percent or less on a permanent basis. This would represent a reduction in unemployment from the current level in excess of 1.5 points, or more than 300,000 permanent new jobs. National income would increase by more than \$30 billion annually, which translates into \$1.5 tril-

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lion on a capitalized basis. The potential payoff is so large that the decision to increase the inflation target into the 2.5 to 3 percent range should be taken even if it has only a small chance of materializing. We have everything to gain and little to lose.

Adopting this strategy would require the Bank of Canada to be opportunistic on the expansionary side and tighten only if there are tangible signs that inflation is beginning to exceed 3 percent and will keep rising. This new approach would bring the Bank in line with the successful strategy adopted by the US Federal Reserve under Chairman Greenspan.

The setting of an official inflation target is not inconsistent with the flexible opportunistic approach to inflation control recommended here. If the game of inflation targeting is retained, Canada should avoid the twin mistakes of setting a rigid long-term target and setting a target of less than 2 percent. Freezing the long-term inflation target is not sensible because what is perceived as the optimal level of inflation will always depend crucially on the state of economic knowledge and economic conditions (e.g., errors in measuring inflation, the growth rate of productivity, changing economic institutions). Both will evolve over time. Setting the inflation target below 2 percent now would amount to a cavalier dismissal of the emerging body of evidence on the potentially important role played by nominal wage and price rigidities at very low levels of inflation. Under the constraint that inflation targeting is to remain the official monetary strategy in Canada, the ideal decision would definitely be to move the current 1 to 3 percent inflation-target range up by a point to the 2 to 4 percent range. A 1.5 to 3.5 percent range would be a fine compromise for now.

NOTE

I thank Chris Ragan and Andrew Sharpe for helpful discussions and advice.

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